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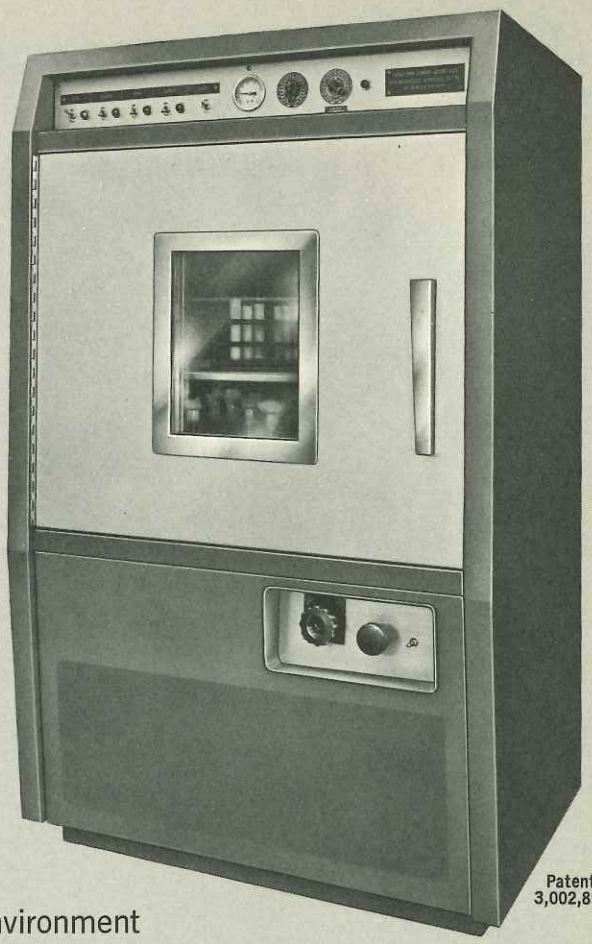
GROUP 170

PsycroTherm™

THE CONTROLLED ENVIRONMENT INCUBATOR SHAKER



Patent No. 3,002,895

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The PsycroTherm combines a controlled environment incubator with a continuous-duty shaking mechanism. A large growth chamber provides 10½ cubic feet of usable work space where shake cultures and static cultures can be exposed to the same conditions of temperature and atmosphere. In the PsycroTherm the rate of agitation can be selected and the temperature controlled to meet a variety of applications. Operating in a thermal range from 0°C to 60°C, this incubator shaker is ideal for psychrophilic, mesophilic and thermophilic organisms. Anaerobic cultures may be propagated in gaseous atmospheres which are circulated in the chamber or introduced directly into the culture vessels. The PsycroTherm can also be used as a refrigerator or a BOD incubator. Models are available with Gyrotory® or reciprocal agitation, and with high-output illumination for photosynthetic studies. Many interchangeable shaker platforms can be provided with large capacities for flasks, test tubes and other vessels.

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NBS

NEW BRUNSWICK SCIENTIFIC CO., INC.

1130 SOMERSET ST., NEW BRUNSWICK, NEW JERSEY 08903

Manufacturers and Distributors of Precision Laboratory Apparatus

435/303.3

PSYCROTHERM - THE CONTROLLED

Gyrotory® and Reciprocal Drives

The Gyrotory shaker mechanism is built with precision for *continuous service* and reproducible agitation. Acting through a triple eccentric drive transmission, a powerful ball-bearing motor rotates the shaking platform horizontally in a circular orbit describing a 1″ circle*. The platform rides smoothly on nine heavy-duty ball bearings to achieve reproducible agitation and extremely long life.

Speed is adjusted mechanically from 50 to 400 rpm, and is maintained without drift or variation. Once set, speed remains constant, regardless of normal fluctuations in line voltage, unbalanced loading, or changes in workload. The drive is carefully counterbalanced to impart uniform rotary motion to all vessels with minimum vibration. Even with a full load at maximum speed, operation is extremely smooth, quiet and dependable.

The Reciprocating Drive Mechanism has the power and precision that characterize all New Brunswick shakers. Workloads roll smoothly and quietly on four sealed ball bearings in precision-machined tracks. Smooth, linear agitation is transmitted uniformly to the culture medium in all vessels. A wide range of agitation and aeration can be obtained with a mechanically adjustable speed range from 40 to 285 oscillations per minute, and a variable stroke amplitude, adjustable between 0 and 3½″.

** Units with 2″ orbital motion are also available.*

ENVIRONMENT INCUBATOR SHAKER

Rigid Temperature Regulation

The PsycroTherm has a temperature range from 0°C to 60°C. Control tolerance and temperature gradient are both within ± 0.5°C. (See Temperature Control Data below). Low-watt-density Nichrome heating elements which have relatively low surface temperature, are installed over a large area to achieve rapid equilibration without heavy surges of heat. The heater is mounted in an air duct and is completely protected from accidental spillage.

A Dependable Thermostat accurately controls heating and cooling. At temperatures approaching ambient, heat and refrigeration systems cycle on and off alternately for close thermal regulation. In addition to the main thermostat, a safety thermostat is incorporated in the control circuit to insure constant operating temperature.

The Refrigeration System is designed for quick response and rigid temperature regulation. It incorporates a large-capacity compressor which is hermetically sealed, permanently lubricated, and warranted for 5 years. Rapid cooling is achieved by automatic circulation of Freon on control demand, refrigerating chamber air as it rushes past the coils. With low temperature available, cultures can be conveniently refrigerated at the completion of a run to arrest further growth or activity.

The Environmental Chamber

The PsycroTherm provides an environmental growth chamber with 10½ cu. ft. of usable work space. The stainless steel chamber is thoroughly insulated and has an extremely low heat transfer coefficient for close temperature uniformity.

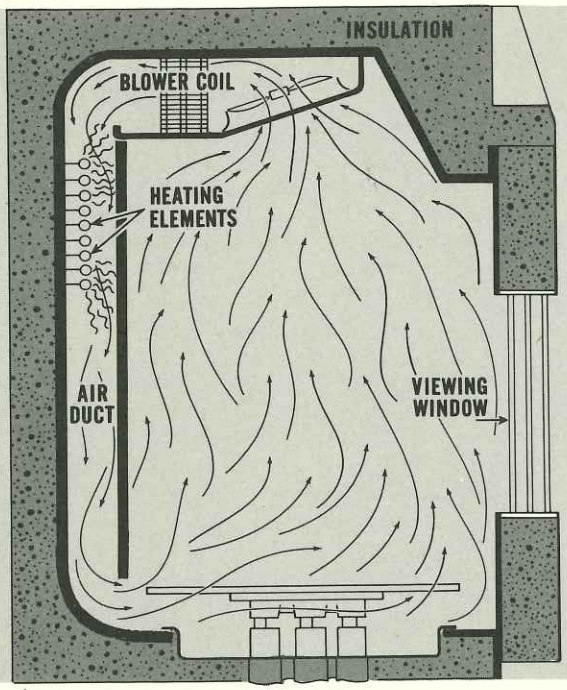
Work is observed through a hermetically sealed, triple-pane viewing window in the incubator door. The door seals against a continuous rubber gasket and opens a full 180°, permitting complete access to the chamber interior. There are two incubator shelves of heavy-gauge aluminum, which are adjustable in position. Both shelves combined, can accommodate a total of 108 standard petri dishes or 120 small BOD bottles. Capacity may be increased by replacing the shaker platform with a utility tray. An electric outlet inside the chamber is used for the operation of small electrical equipment such as magnetic stirrers or tissue culture rollerdrums.

TEMPERATURE CONTROL DATA*

Chamber Temperature	Uniformity (Gradient)	Control Tolerance (Sensitivity)	Approximate Heat-up and Pull-down Time From Ambient
0°C.	± 0.3°C.		45 min.
10°C.	± 0.3°C.		30 min.
25°C.	± 0.25°C.	± 0.2°C.	8 min.
37°C.	± 0.35°C.		40 min.
50°C.	± 0.35°C.		73 min.
60°C.	± 0.35°C.		100 min.

* Based on temperature tests conducted with Models G26 and R26, having no work load in the chamber, and where ambient was 21°C.

PSYCROTHERM - THE CONTROLLED

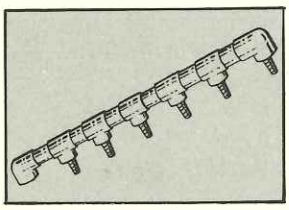


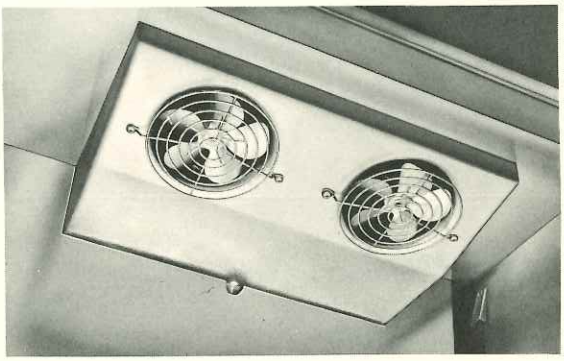
Mechanical Air Circulation

Air is drawn rapidly to the top of the chamber by fans in the chamber ceiling. As air is swept over cooling coils, it is deflected down the air duct, where it passes over the heating elements. Conditioned air is then channeled to the bottom of the chamber, dispersed upwards, and diffused uniformly throughout the growth chamber.

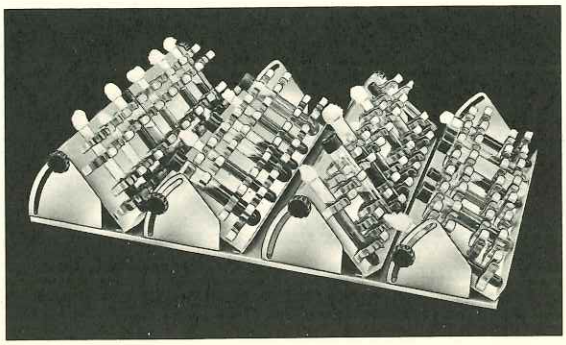
Gassing

Gaseous Environments or humidified atmospheres can be circulated in the chamber by bleeding gas into the hose connection on the lower control panel. The PsycroTherm is tightly sealed, but is not designed to maintain positive or negative pressure. A flowmeter accessory can be furnished with an integral control valve for metering gas to the chamber. Efficient use of gases can be achieved with a six-port gassing manifold accessory which allows gas to be introduced directly into the culture vessels.





Blower Coil: (View From Below)—Mounted in the chamber is a blower unit with twin exhaust fans and cooling coils. The unit has an air displacement of 170 CFM which keeps chamber air in continuous motion to achieve a uniform temperature gradient.



◀ **Adjustable Test-Tube Slant Rack:** Four aluminum slant racks are mounted on a shaker platform. The racks are individually adjustable in position between 4° and 50° from horizontal, and can be locked at the desired angle. Each rack holds 15 clamps which are adjustable for various size test tubes from 16 mm to 25 mm in diameter.

All-Purpose Utility Platform: An aluminum platform with a non-skid rubber surface is used as a carry-all for shaking flat-bottom vessels without a clamping device. Because of the counter-balanced drive, unsupported vessels can be shaken in a fixed position at rotary speeds up to 150 rpm; or at reciprocal speeds up to 90 cycles per minute with a 1½" stroke.

ENVIRONMENT INCUBATOR SHAKER

APPLICATIONS

- **Growth of aerobic and anaerobic microorganisms in a controlled environment.**
- **Cultivation of filamentous fungi, molds, yeasts, actinomycetes, bacteria, mammalian and plant tissue cultures, as well as virus or phage-host systems.**
- **Provides unitized facility for investigating the influence of various environmental factors on the microbial production of antibiotics, vitamins, etc.**
- **Useful in genetic, enzyme and blood chemistry investigations, and for stability studies on vaccines, hormones, antibiotics, and other pharmaceuticals.**
- **Expedites investigations of photosynthetic organisms by utilizing a plug-in lighting manifold.**
- **Meets APHA standards for BOD determinations and provides facility for using the Sierp apparatus.**

Operating Controls

A dial thermometer, thermostats and switches are recessed at the top of the cabinet to prevent inadvertent change of settings. The chamber is illuminated automatically when the door is opened, but can also be illuminated manually when the door is closed.

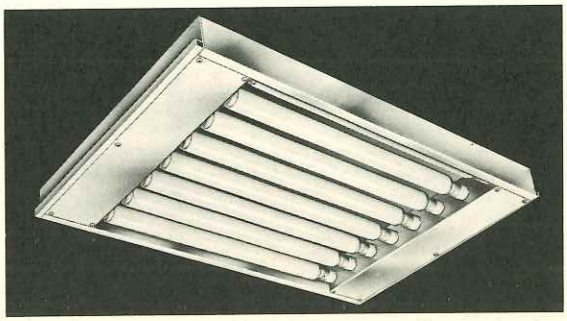
New Types of Research Possible

Many phases of the microbial environment can be varied with the PsycroTherm. It is now possible to study the growth characteristics of organisms as a function of atmosphere, under both static and agitated conditions, in a *single* unit at *one* time. Using several units, a series of investigations can be conducted simultaneously where cultures may be propagated under different levels of temperature and light intensity.

Photosynthetic Investigations

PsycroTherm Models G27 and R27 are equipped with a removable light manifold for photosynthetic studies. The manifold comprises 8 high intensity fluorescent lamps having a total illumination output of 9,840 lumens (at 40% rated life). Various light intensities are achieved by adjusting the position of the manifold on 1″ centers. A duplex light manifold is also available*. It has 6 fluorescent lamps with a total output of 180 watts; and 4 pencil type incandescent lamps with a total output of 120 watts. Light programmers can be supplied for automatic control of illumination. Model P-30 regulates light and dark cycles for periods from 30 minutes to 30 hours. Model PT-30 employs 2 control thermostats and timers for simultaneous programming of temperature and illumination. With this model, temperature from 0 to 60°C can be maintained at one level during the light cycle, and at another level during the dark cycle. Length of the cycles are individually adjustable from 30 minutes to 30 hours. Other manifolds and programmers can be provided to meet individual requirements.

**Not interchangeable with standard manifolds. Prices on request.*



ENVIRONMENTAL INCUBATOR SHAKER

ErlAngle Rotary Shaking

The ErlAngle Flask clamp secures the base of the flask at a 15° angle from the platform. When shaken, the flask contents rise from the bottom and are vigorously washed around the walls of the inclined flask without wetting the stopper. This type of agitation exposes more liquid surface area to the atmosphere, producing faster reactions and more active aeration.

ErlAngle Method

Conventional Method

Modifications

Special platforms can be furnished with a combination of two different clamp sizes to meet individual requirements. In addition, holding devices for various types of glassware not listed here, as well as other modifications, can be made for special applications.

Electrical Safety Features: All wiring is grounded to conform with N.E.M.A. standards, and is insulated in accordance with the National Electrical Safety Code.

Units equipped for 3-phase service are protected by magnetic starters. There is a 6 ft. grounded electric cord and a grounding adapter for either 2 or 3-wire receptacles.

Construction: The shaker mechanism is firmly mounted on an angle-iron frame in a sturdy steel chassis. The cabinet is rigidly fabricated of heavy gauge steel and is handsomely finished in deep-grey Armorhide and fluted aluminum.

SPECIFICATIONS

		MODEL G26	MODEL G27	MODEL R26	MODEL R27
Temperature Range [1]		0°C to 60°C, within ± ½°C			
Speed Range		50 to 400 rpm		40 to 285 strokes per minute	
Stroke [2]		Rotary motion describing a 1" circle		Reciprocal motion, variable from 0 to 3½"	
Dimensions		Width	Front-to-back	Height	
Overall		40½"	29"	66"	
Chamber		32½"	21"	26"	
Platform Dimensions		18" x 30"		18" x 27"	
Shelf Dimensions		19½" x 32½"		19½" x 32½"	
Fluorescent Light Manifold [3]		None	Included	None	Included
Heater		Low-watt-density Nichrome heating elements			
Drive Motor		¼ hp, ball-bearing, 1725 rpm			
Refrigeration Compressor		⅓ hp, hermetically sealed		⅓ hp, hermetically sealed	
Electrical Service Data (A.C.) [4]	115V 60C, 1-Phase	15 Amps	17 Amps	15 Amps	17 Amps
	208V & 230V 60C, 230V 50C, 1-Phase	9 Amps	10 Amps	9 Amps	10 Amps
	208V & 220V 60C, 220V 50C, 3-Phase	7 Amps	8 Amps	7 Amps	8 Amps
Net Weight (Approx.)		990 Lbs.	1,010 Lbs.	965 Lbs.	985 Lbs.
Shipping Weight (Approx.)		1,130 Lbs.	1,150 Lbs.	1,105 Lbs.	1,125 Lbs.

(1) Higher temperatures can also be provided.
(2) Also available with a 2" stroke on special order at $100 additional.
(3) Note: Models G26 and R26 are not designed for use with the light manifold.
(4) Other electrical services not listed above can be provided on special order.

PRICE LIST OF THE PSYCROTHERM LESS SHAKER PLATFORM

MODEL	AGITATION	LIGHT MANIFOLD	ELECTRICAL SERVICE[1]	CATALOG NO.	PRICE[2]
G26	Gyrotory	None	115 Volts, 1 Phase, 60 Cycle	G26-151-60	**$2,675**
			208 Volts, 1 Phase, 60 Cycle 3-Wire	G26-281-63	
			230 Volts, 1 Phase, 60 Cycle	G26-231-60	
			208 Volts, 3 Phase, 60 Cycle 4-Wire	G26-283-64	**$2,825**
			220 Volts, 3 Phase, 60 Cycle	G26-223-60	
G27	Gyrotory	Included	115 Volts, 1 Phase, 60 Cycle	G27-151-60	**$2,935**
			208 Volts, 1 Phase, 60 Cycle 3-Wire	G27-281-63	
			230 Volts, 1 Phase, 60 Cycle	G27-231-60	
			208 Volts, 3 Phase, 60 Cycle 4-Wire	G27-283-64	**$3,085**
			220 Volts, 3 Phase, 60 Cycle	G27-223-60	
R26	Reciprocal	None	115 Volts, 1 Phase, 60 Cycle	R26-151-60	**$2,625**
			208 Volts, 1 Phase, 60 Cycle 3-Wire	R26-281-60	
			230 Volts, 1 Phase, 60 Cycle	R26-231-60	
			208 Volts, 3 Phase, 60 Cycle 4-Wire	R26-283-64	**$2,775**
			220 Volts, 3 Phase, 60 Cycle	R26-223-60	
R27	Reciprocal	Included	115 Volts, 1 Phase, 60 Cycle	R27-151-60	**$2,825**
			208 Volts, 1 Phase, 60 Cycle 3-Wire	R27-281-63	
			230 Volts, 1 Phase, 60 Cycle	R27-231-60	
			208 Volts, 3 Phase, 60 Cycle 4-Wire	R27-283-64	**$2,975**
			220 Volts, 3 Phase, 60 Cycle	R27-223-60	

(1) Also available in 50 cycle service; 230 Volts, 1 Phase, and 220 Volts, 3 Phase. Prices available on request.

(2) Above prices include two incubator shelves but do not include cost of shaker platform. For total cost, add price of desired platforms to cost of apparatus. When ordering, kindly use appropriate catalog numbers listed on pages 7 and 8. All prices are F.O.B. New Brunswick, N. J., subject to change without notice.

PRICE LIST OF GYROTORY SHAKER PLATFORMS[3]

MODELS G26 and G27

CATALOG NO.	CAPACITY OF PLATFORM OR TEST-TUBE RACK			PRICE[4]
	No. of Clamps		Size of Glassware	
AG-25	166		25 ml Erlenmeyer Flask	**$165**
AG-50	108		50 ml Erlenmeyer Flask	**137**
AG-125	60		125 ml Erlenmeyer Flask	**130**
AG-250	40		250 ml Erlenmeyer Flask	**110**
AG-300	40		300 ml Erlenmeyer Flask	**110**
AG-500	24		500 ml Erlenmeyer Flask	**106**
AG-1	15		1 liter Erlenmeyer Flask	**100**
AG-2	12		2 liter Erlenmeyer Flask	**94**
AG-25F	5		2500 ml Low Form Culture Flask	**92**
AG-28	6		2800 ml Fernbach Flask	**88**
AG-4	6		4 liter Erlenmeyer Flask	**88**
AG-6	4		6 liter Erlenmeyer Flask	**76**
AG-A125	60		125 ml Flask on 15° ErlAngle Clamp	**$195**
AG-A250	40		250 ml Flask on 15° ErlAngle Clamp	**150**
AG-A500	24		500 ml Flask on 15° ErlAngle Clamp	**130**
	Tubes per Rack	No. of Racks		
AG-TT-25	21	7	25 mm Coated Test-Tube Rack	**$110**
AG-TT-20	33		20 mm Coated Test-Tube Rack	
AG-TT-13	48		13 mm Coated Test-Tube Rack	
AG-TA-25	15	4	Test-Tube Slant Rack for 16 mm to 25 mm Tubes	**$120**
AG-00	NONE		Utility Platform with Non-Skid Rubber Surface	**$ 51**

(3) Gyrotory shaker platforms have slightly different dimensions than reciprocating platforms and are not interchangeable with reciprocating Models. The above platforms are interchangeable with New Brunswick shakers, Models G10 and G25.

(4) All prices are F.O.B. New Brunswick, N. J., subject to change without notice.

ACCESSORIES

DESCRIPTION	CATALOG NO.	PRICE[1]
Fluorescent Light Manifold[2]	XG27-141	$160.00
6-Port Gassing Manifold (Installed)	X-1174	$ 35.00
Air Flowmeter[3] Mounted in an attachable assembly with needle valve control from 0 to 16 liters per min.	XH-554-A	$ 65.00
Grease Gun	XH-169	$ 5.00
Grease, 5 lb. container	XH-404	$ 3.00
Grease, 1 lb. container	XH-239	$ 1.50
Oscillation Counter: (Determines exact rpm of shaker)	X-M1	$ 15.00

NEW BRUNSWICK WARRANTY POLICY

ONE YEAR UNCONDITIONAL WARRANTY

The New Brunswick Scientific Company, Inc. warrants the PsycroTherm to be free from defects in material and workmanship under normal use for twelve months from date of delivery to the original purchaser.

ADDITIONAL FOUR YEAR REFRIGERATION COMPRESSOR WARRANTY

At any time within four years from expiration of the above Warranty, the company will repair or replace the refrigeration compressor which shall be found defective by the company.

The above four year Warranty applies only to the compressor of the PsycroTherm installed in continental United States, and does not cover the complete refrigeration system.

PRICE LIST OF RECIPROCATING SHAKER PLATFORMS

MODELS R26 and R27

CATALOG NO.	CAPACITY OF PLATFORM OR TEST-TUBE RACK			PRICE[1]
	No. of Clamps	Size of Glassware		
AR26-25	146	25 ml Erlenmeyer Flask		$150
AR26-50	104	50 ml Erlenmeyer Flask		134
AR26-125	60	125 ml Erlenmeyer Flask		130
AR26-250	40	250 ml Erlenmeyer Flask		110
AR26-300	35	300 ml Erlenmeyer Flask		101
AR26-500	24	500 ml Erlenmeyer Flask		106
AR26-1	15	1 liter Erlenmeyer Flask		100
AR26-2	9	2 liter Erlenmeyer Flask		80
AR26-25F	4	2500 ml Low Form Culture Flask		82
AR26-28	6	2800 ml Fernbach Flask		88
AR26-4	6	4 liter Erlenmeyer Flask		88
AR26-6	4	6 liter Erlenmeyer Flask		76
	Tubes per Rack	No. of Racks		
AR26-TT-25	21	7	25 mm Coated Test-Tube Rack	$110
AR26-TT-20	33		20 mm Coated Test-Tube Rack	
AR26-TT-13	48		13 mm Coated Test-Tube Rack	
AR26-TA-25	15	4	Test-Tube Slant Rack for 16 mm to 25 mm Tubes	$120
AR26-00	NONE		Utility Platform with Non-Skid Rubber Surface	$ 51

(1) All prices are F.O.B. New Brunswick, N. J., subject to change without notice.
(2) Available for use in Models G27 and R27 only.
(3) Flowmeters designed for other capacities and gases are also available.

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